KARNATAKA STATE AKKAMAHADEVI WOMEN'S UNIVERSITY, VIJAYAPURA

SYNOPSIS

On

Assessment of Nutritional Status, Dietary Patterns, Physical Activity and Sleep Quality among Adolescent Girls (13-16 years) of Vijayapura District of Karnataka

FOOD PROCESSING AND NUTRITION

By

Ms. SHRUTI NAYAK

Research Scholar

Guide

Dr. PRASHANTH S J

Associate Professor

DEPARTMENT OF FOOD PROCESSING AND NUTRITION

KARNATAKA STATE AKKAMAHADEVI WOMEN'S UNIVERSITY, VIJAYAPURA

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SYNOPSIS

1. Name	**:** Shruti Nayak
2. I.D. No. and year of admission	**:** PHFN2003, 2019-20
3. Degree programme and subject	**:**Ph.D., Food Processing and Nutrition
4. Title of research	**: Assessment of Nutritional Status, Dietary Patterns, Physical Activity and Sleep Quality among Adolescent Girls (13-16 years) of Vijayapura District of Karnataka**.

5. INTRODUCTION:

India is the second most populated country next to China. More than 50% of the population is below 25 years old. According to the census of India 2011, 43.3% of the adolescent population were females. The adolescent (10-19 years) population of Vijayapura was 4, 54,313. The World Health Organization (WHO) defines adolescence as 10-19 years. It is a period during which rapid growth and development occurs which necessitates maximum nutrition and health care. Poor nutrition during this period can delay achievement of maturation. During adolescence 50% of adult weight and 25% of adult height is achieved. Compromised diet during adolescence can lead to macronutrient and micronutrient deficiencies.

Healthy lifestyles in adolescence lay a foundation for wellbeing in adulthood. Previous studies have shown that Indian adolescent diets are deficient in nutrients and are far to meet the Recommended Dietary Allowances (RDA). Lifestyle factors like dietary habits, sleep patterns, physical activity etc increase the prevalence of overweight or obesity. Many studies are conducted to know the relationship between nutritional status, dietary habits, sleeping patterns and physical activity. Among these factors sleep duration found to have an association with overweight and obesity in most of the studies which are conducted outside India.

6. OBJECTIVES OF THE INVESTIGATION:

a) To assess the nutritional status, dietary patterns, physical activity and sleep quality among adolescent girls of Vijayapura district.
b) To assess the morbidity rate of adolescent girls of Vijayapura district.

c) To examine the association between nutritional status, dietary patterns, physical activity and sleep quality among adolescent girls of Vijayapura district.

d) To compare the nutritional status, dietary patterns, physical activity and sleep quality of urban and rural adolescent girls of Vijayapura district.

e) To impart nutritional education to urban and rural adolescent girls of Vijayapura district.

7. BRIEF REVIEW OF WORK

i. Relationship between nutritional status and physical activity

Lahiri *et al.* (2020) studied the effects of dietary habits and physical activity on overnutrition. A sample of 625 adolescents consisting of 304 males and 341 females of 14-19 years were selected for the study. A pretested questionnaire was used to collect the data regarding physical activity and dietary habits, socio-demographic data was collected initially. BMI was calculated by using height and weight. The results showed that most of the adolescents had unhealthy dietary habits and more than half of the sample had fast foods thrice a week. Results also revealed that nearly half of the sample had inadequate physical activity.

Slowik *et.al.* (2019) studied nutritional status among children and adolescents with different levels of physical activity among 1013 students between7 to 18 years old. Height and weight of the students were measured and BMI was calculated. Results showed that the majority of the sports oriented and general group students had normal weight.

Swetha *et al.* (2018) studied student's nutritional status and physical activity. The sample of 100 students consisting of 51 female and 49 male was selected for the study. The questionnaire was prepared and administered among the students. The results revealed that around 50 per cent of the students were engaged in physical activity for 1-6 days a week, about 60 percent of the students had normal weight, around 70 per cent of the students had breakfast all the days and around 60 per cent of the students sometimes had food choices.

ii. Relationship between dietary patterns and physical activity

Wadolowska *et al.* (2016) conducted study to examine the association physical activity patterns and dietary patterns among Polish girls. A sample of 1107 of the age group 13-21years were selected for the study. The closed questionnaire was used to collect the data regarding diet, attitude towards food, nutritional and health. The International Physical

Activity Questionnaire (IPAQ-L), Block Screening Questionnaire for Fruit/Vegetable/Fibre Intake (BSQFVF), Block Screening Questionnaire for Fat Intake (BSQF) and Food Intake Variety Questionnaire (FIVeQ) were administered. Activities during the last 7 days were considered. The association between physical activity and dietary patterns were verified by regression analysis. The results revealed that half of the sample were in moderate activity level. There was a significant association between upper tertiles of school/work activity, upper tertiles of recreation and upper tertiles of yard activity with upper tertiles of fruits and vegetable consumption pattern.

Mithra *et al.* (2015) studied association of physical activity, dietary habits with obesity. Total sample for the study was 2963 adolescent girls. Face to face interviews were conducted to collect the data regarding dietary habits and physical activity. Height and weight were collected to calculate BMI. Mann–Whitney U-test, Kruskal–Wallis test, and Chi-square ($\chi 2$) tests were used. The results revealed the majority of the subjects ate readymade foods and only one third of the respondents reported eating in between the regular meals. Among the respondents who reported eating readymade foods majority of them had normal weight followed by underweight. The results also revealed that respondents who spent more time in physical activity were normal.

Doustmohammadian *et al.* (2013) investigated the patterns of physical activity and dietary habit in relation to weight status in adolescent girls. A sample 256 students were selected for the study. Anthropometric measurements were taken for the entire sample. Nutrient intake was collected using 24-hour dietary recall and food record questionnaires and Physical activity was assessed using Baecke et al. questionnaire. Chi-square, Fisher exact test, and Coefficient correlation were computed. The results showed a significant and positive relationship of BMI with intake of fat, energy intake of fat and intake of fast foods. A significant difference in physical activity level was found among all nutritional groups.

iii. <u>Relationship between nutritional status and sleeping pattern</u>

Mozaffari-Khosravi *et. al.* (2020) studied the relationship between nutritional status and sleep quality among 381 adolescents of 12-16 years old. Demographic data was collected through school records, anthropometric measurements were taken and BMI was calculated. Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep quality, interview was used to collect the data regarding dietary patterns and Physical Activity Questionnaire (IPAQ-SF) for assessing physical activity. Mean, SD were computed, Kolmogorov-Smirnoff test and Tukey

HSD Post hoc analysis were done. The results showed non-significant relationship between sleep quality and nutritional status.

Patalia and Shekhar (2020) examined the relationship between nutritional status and sleeping patterns of 150 adolescent girls. Anthropometric measurements were taken, and sleeping patterns and lifestyle were assessed using questionnaires. Dietary patterns were assessed using a 24 hours recall method. The results revealed that the majority of the girls had regular breakfast, good sleeping patterns of 6 to 8 hours. It was also found that energy intake was highly significant with quantity of sleep. Girls having 4 meals/day had good sleeping patterns.

Zhang *et.al.* (2020) conducted a study to examine the association of sleep timing with weight status among 1194 adolescents of 14- to 19-year-old adolescents in Wuhan, China. Questionnaires were used to collect demographic data, academic performance, diet, mental health status, physical activity, sleep characteristics, body weight, and height. The Pittsburgh Sleep Quality Index (PSQI), food frequency table, Center for Epidemiological Studies-Depression Scale (CES-D), Rosenberg Self-Esteem Scale, The Simplified Chinese version of the 10-item Perceived Stress Scale (SCPSS-10) and Physical Activity Questionnaire (PAQ) were used to measure sleeping characteristics, dietary habits, depression, self-esteem, perceived stress and physical activity of subjects respectively. Questions related to bedtime and waking and sleep onset latency were used. The t test, rank sum test, Pearson's χ 2, Odds ratios (ORs), linear regression model, and inflation factor (VIF) were calculated. The results showed that there was no significant association between bedtime and BMI, where as a significant relationship was found between waking up time and BMI.

Faizi *et. al.* (2015) conducted a study to know the association between sleep duration and nutritional status among 1416 (Males-712 and Females-704) adolescents of 13-15 years old. The student's height and weight were taken. A proforma consisting of particulars of sleep duration was used to collect data regarding sleep. The results revealed that there was a significant difference between sleep duration and nutritional status. Majority of adolescents with adequate sleep duration had normal nutritional status

iv. Relationship between physical activity and sleeping pattern

Machal *et. al.*(2018) examined the effect of physical activity on sleeping patterns among 974 children from Brno. Sleep timing, sport activity duration in a typical week (outside school 126 hours, open-ended answer, indicated in hours), anthropometric data were collected using questionnaire. Bicycle ergometry was used to assess physical activity. Correlation was calculated. Results revealed that physical fitness is significant predictor of bedtime. BMI is positively associated with bedtime ad negatively associated with sleep duration

v. Association between nutritional status, dietary patterns, physical activity, sleeping pattern

Grygiel-Go´rniak *et al.* (2016) studied the relationship between nutritional status, dietary habits, and level of physical activity in a group of women and men. The sample consists of 151 students. Anthropometric measurements were taken and dietary patterns were assessed using 24-hour recall method. The physical activity level of the subjects was measured using the International Physical Activity Questionnaire. Data was subjected to ANOVA test and correlation. The results revealed that there was a significant difference between male and female students, dietary patterns were significantly and positively correlated with BMI and physical activity.

De Souza Neto *et. al*(2020) conducted a study to know the prevalence of sleep quality and duration and its association with factors like physical activity, screen time and nutritional status of adolescents. Around 1432 adolescents of 10-14 years old were selected for the study. Socio-demographic data was collected. Physical activity questionnaire was used to measure physical activity, sedentary behaviour was measured as time spent on screen activities on weekdays, BMI was used to determine the nutritional status, 24 hours recall method was used to measure food consumption, sleep duration and sleep quality was assessed by based on the questions regarding sleep. Mean, SD, binary logistic regression were calculated. Results revealed that 1/3rd of the sample were physically inactive and overweight. Short sleep duration was associated with play activity.

Fatima *et al.* (2019) assessed nutritional status of adolescent girls and the association of factors such as socio-economic status, dietary habits and physical activity pattern with nutritional status. About 322 adolescent girls from 4 schools were selected as the sample for study. Questionnaire containing questions related to socio demographic variables, eating

patterns, food frequency and physical activity pattern was used to collect information. Data were subjected to ANOVA, chi-square and regression analysis. Majority of the vegetarians and non vegetarians were in the category of normal weight, the majority of the girls having normal weight had 2-3 meals per day. Half of the samples with normal weight were not having any physical activity, spent more than 4 hours watching TV. However, significant differences were not observed.

Afzal *et al.* (2017) assessed the nutritional status, physical activity pattern and dietary practices among female adolescents in district Okara, Pakistan. A sample of 850 students consisting of 401 private school students and 449 government school students of Okara district. Anthropometric measurements were taken. Physical activity questionnaire was used to assess the physical activity level and a separate questionnaire was used to assess eating habits. Chi-square test was computed. The results revealed that private school girls were taller and heavier and had sedentary lifestyles. Both private and government school girls lack physical activity.

Aguilà *et al.* (2017) studied nutritional status, food quality and the physical activity levels of school children. A sample of 1374 schoolchildren aged from 3 months to 16.5 years was selected for the study. Socio-demographic variables and anthropometric measurements were taken. KidMed survey and 24 hours survey method was employed to collect the data regarding dietary habits, a survey questionnaire was used to measure the level of physical activity level. Mean, SD, frequency, percentages and chi-square test were done for the data. The results revealed that the majority of the sample had an optimum diet, consumed fruits daily, and took carbohydrates before going to school. The results also revealed that the majority of the children and adolescents had out of school physical activity.

Lee *et al.(*2017) examined the association of sleep duration with diet, physical activity, mental status and weight among 31,407 Korean students. Demographic data and anthropometric measurements were noted. Questions related to physical activity, sleeping pattern and dietary habits were asked and responses were noted. Chi-square test, odds ratio, and multivariate analysis were calculated. Both male and female students with less than 5 hours of sleep had higher BMI and short sleeping duration was associated with overweight and obesity.

Zayed *et al.*(2017) examined the association between lifestyle and nutritional status among high school students. A total of 701 high school students among which 313 males and

388 females were selected for the study. Socio demographic and anthropometric data were collected. Nutritional assessment was done using semi-quantitative food frequency questionnaire (FFQ). Mean, SD, chi-square, ANOVA, Tukey's test, unpaired t-test and regression was computed. The results revealed the majority of the students had normal weight, ate more cereals, bread, rice, medium quantity of vegetables and meat, less quantity of fruits and milk.

Ferranti *et.al.* (2016) conducted a study to examine the association between sleep habits, diet pattern and weight status among 1586 adolescents of 11-14 years old attending 15 secondary schools of Silicy. Questionnaire was used to collect demographic data, physical activity level was assessed using Physical Activity Questionnaire (PAQ-A), Pediatric Daytime Sleepiness Scale (PDSS) to assess sleepiness and Food Frequency Questionnaires (FFQs) developed for Italian adolescents was used to collect the data regarding dietary habits. Mean, SD, ANOVA, Chi-square and regression analysis were computed. The results revealed that majority of the subjects had medium level of physical activity, adolescents with normal weight had high level of physical activity, weekdays sleep and weekend sleep than over weight and obese adolescents. Obese adolescents had high day time sleep compared to overweight and normal weight adolescents. Intake of fruits, vegetables and breakfast was positively related to sleep quality and quantity.

Kotecha *et al.* (2013) studied food habits, food preferences, and dietary patterns among 1440 school going urban adolescents in Baroda, India. A self administered questionnaire was used to assess the food habits and dietary patterns. The results revealed that the majority of the adolescents had healthy food habits, consumed adequate cereals, legumes and green leafy vegetables. Most of the adolescents had regular meals. The results also showed that more than half of the students consumed ice creams and chocolates.

Coelho *et al.*(2012) examined the relation between nutritional status, food habits and physical activity level in school children. The sample consisted of 5,963 children (6-9 years old) and 4,897 adolescents (10-14 years old). The socio-demographic data and anthropometric measurements were recorded. Food frequency questionnaire (FFQ) was used to know dietary habits and physical activity was measured by performance of the students in activity for 300 minutes/week. Data were subjected to student t-test and chi-square test. The results revealed that the majority of the students without excess body fat found to perform physical activity more than 300 minutes/week.

Benefice *et.al.* (2004) examined the relationship between sleep, habits, nutritional status, growth and maturation among 40 African adolescent girls. Anthropometric measurements were taken, physical activity was evaluated using accelerometer and sleep was determined by accelerometry counts recorded. Results showed that there was a significant difference between sleep habits of adolescent girls. Significant relationship was found between BMI and sleep habits, thinner girls had longer sleeping hours than corpulent girls.

Dabade and Dabade (2018) examined the prevalence of overweight and obesity and its associated factors among 380 school going children, Height was measured using a Stadiometer and weight was measured using standardised weighing machine. BMI was calculated. The pre designed questionnaire was used to collect demographic data. Percentages and chi-square were calculated. The results showed that the majority of the boys and girls had normal weight. Children with more than 7 hours of sleep had normal weight.

Mohan *et. al.* (2018) assessed prevalence of overweight, obesity and related factors among 900 adolescents of 10-19 years old. Anthropometric measurements were taken and BMI was calculated. Personal data questionnaire and GSHS (Global School based Student Health Survey) was used to collect data. The results revealed that the majority of the subjects participated in outdoor sports. Significant association was found between physical exercise and BMI, outdoor and indoor activities and BMI and also sleeping hours and BMI.

Tambalis e*t. al.* (2018) studied association of sleep duration with dietary habits and obesity among 177091 children and adolescents of 8-17 years old. Demographic data was collected and anthropometric measurements were taken. The Euro-fit PF test battery and KIDMED (Mediterranean Diet Quality Index for children and adolescents) were used to assess Physical fitness level and dietary patterns respectively. Mean, SD, chi-square, t-test, binary logistic regression and the Hosmer and Lemeshow goodness-of-fit test were computed. It was found that adolescents having insufficient sleep had higher BMI, low physical fitness, low physical activity and poor dietary habits.

8. DETAILED PROGRAMME OF RESEARCH

The present study on **"Assessment of Nutritional Status, Dietary Patterns, Physical Activity and Sleep Quality among Adolescent Girls (13-16 years) of Vijayapura District of Karnataka"** is discussed under the following heads:

METHODOLOGY:

- **Research design:**
- Differential design will be used to know the difference between urban and rural adolescent girls of Vijayapura district on nutritional status, dietary patterns, physical activity and sleep quality.
- Correlation design will be used to know the relationship between nutritional status, dietary patterns, physical activity and sleep quality.

Locale of the study: Vijayapura district.

Population: Adolescent girls.

Sample: All the 13 taluks of Vijayapura district will be selected for the research. From each taluk 2 schools (1 urban and 1 rural) will be chosen for data collection. A random sampling technique will be used to select 30 adolescents from each school so that 60 adolescent girls (30 urban and 30 rural) will be selected from 1 taluk. Total sample comprised of 780 adolescent girls of Vijayapura district.

Variables under the study

Dependent variables:

- Nutritional status
- Physical activity
- Sleep quality

Independent variables:

- Dietary patterns
- Locale
- Income
- Age
- Socio economic status

Tools for the study:

- **Socio-economic status scale:**Modified Kuppuswamy socioeconomic scale-2021 will be used to assess the socio-economic status.
- **Nutritional status**: Nutritional status will be assessed by taking anthropometric measurements.

- **Physical Activity:** Physical Activity Questionnaire for Adolescents (PAQ-A) by Kowalski *et al.* (2004) will be used to measure the physical activity.It is a self-administered, 7-day recall instrument. The PAQ-A can be administered in a classroom setting and provides a summary physical activity score derived from eight items, each scored on a 5-point scale. The mean of 8 items will be calculated. A score of 1 indicates low physical activity, whereas a score of 5 indicates high physical activity.
- **Dietary patterns:** A self structured questionaaire ,24 hr recall method and food frequency questionnaire will be used.
- **Sleep quality:** The Pittsburgh Sleep Quality Index (PSQI-1988) will be used to assess the sleep quality. It is a self-report questionnaire that assesses sleep quality over a 1-month time interval. The measure consists of 19 individual items, creating 7 components that produce one global score. The component scores consist of subjective sleep quality, sleep latency (i.e., how long it takes to fall asleep), sleep duration, habitual sleep efficiency (i.e., the percentage of time in bed that one is asleep), sleep disturbances, use of sleeping medication, and daytime dysfunction. Each item is weighted on a 0–3 interval scale. The global PSQI score is then calculated by adding the seven component scores, providing an overall score ranging from 0 to 21, where lower scores denote a healthier sleep quality.
- **Morbidity rates:** A self-structured questionnaire consisting a list of common morbidities will be used.

Statistical analysis:

- Frequency, percentage, mean and standard deviation will be used to show the sample distribution on variables.
- To test the difference between urban and rural adolescent girls on nutritional status, dietary patterns, physical activity and sleeping pattern t-test will be computed
- To measure the relationship between nutritional status, dietary patterns, physical activity and sleeping pattern correlation will be computed.

9. SPECIAL FEATURES OF INVESTIGATION:

- The present study will explore the interrelationship of nutritional status, dietary patterns, physical activity and sleeping pattern. This will help to improve the adolescent's dietary pattern and sleeping pattern and also improve the physical activity levels.

- It will help to create awareness on importance of dietary pattern and sleeping pattern.
- This will help the government of Karnataka to make a policy to mitigate the poverty and also improve the nutritional status of adolescent girls of Karnataka

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